OIPE WP18
SEP 15 2005
PATENT & TRADEMARK OFFICE

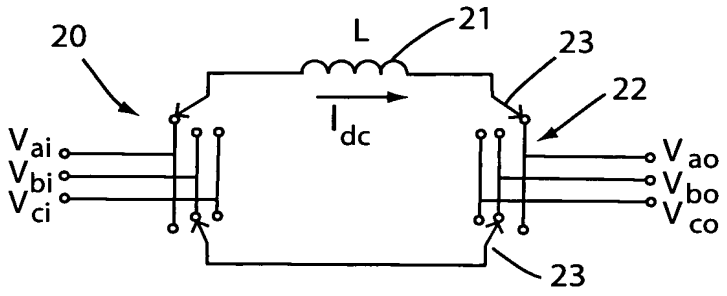

FIG .1 (prior art)

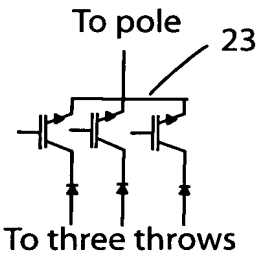

FIG. 2 (prior art)

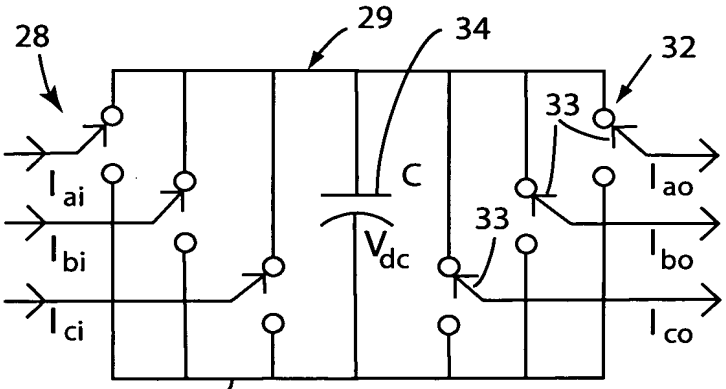

FIG.3 (prior art)

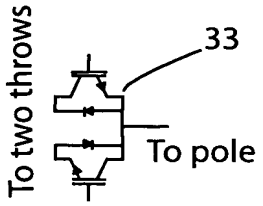

FIG.4 (prior art)

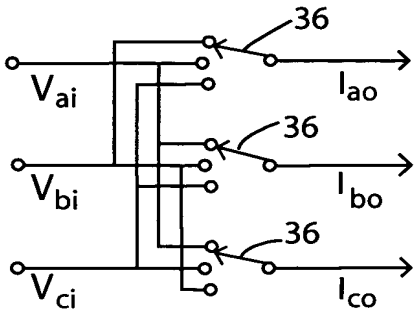

FIG. 5 (prior art)

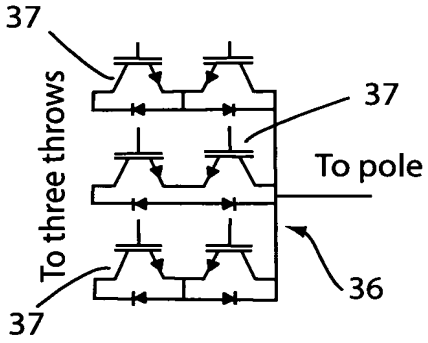

FIG.6 (prior art)

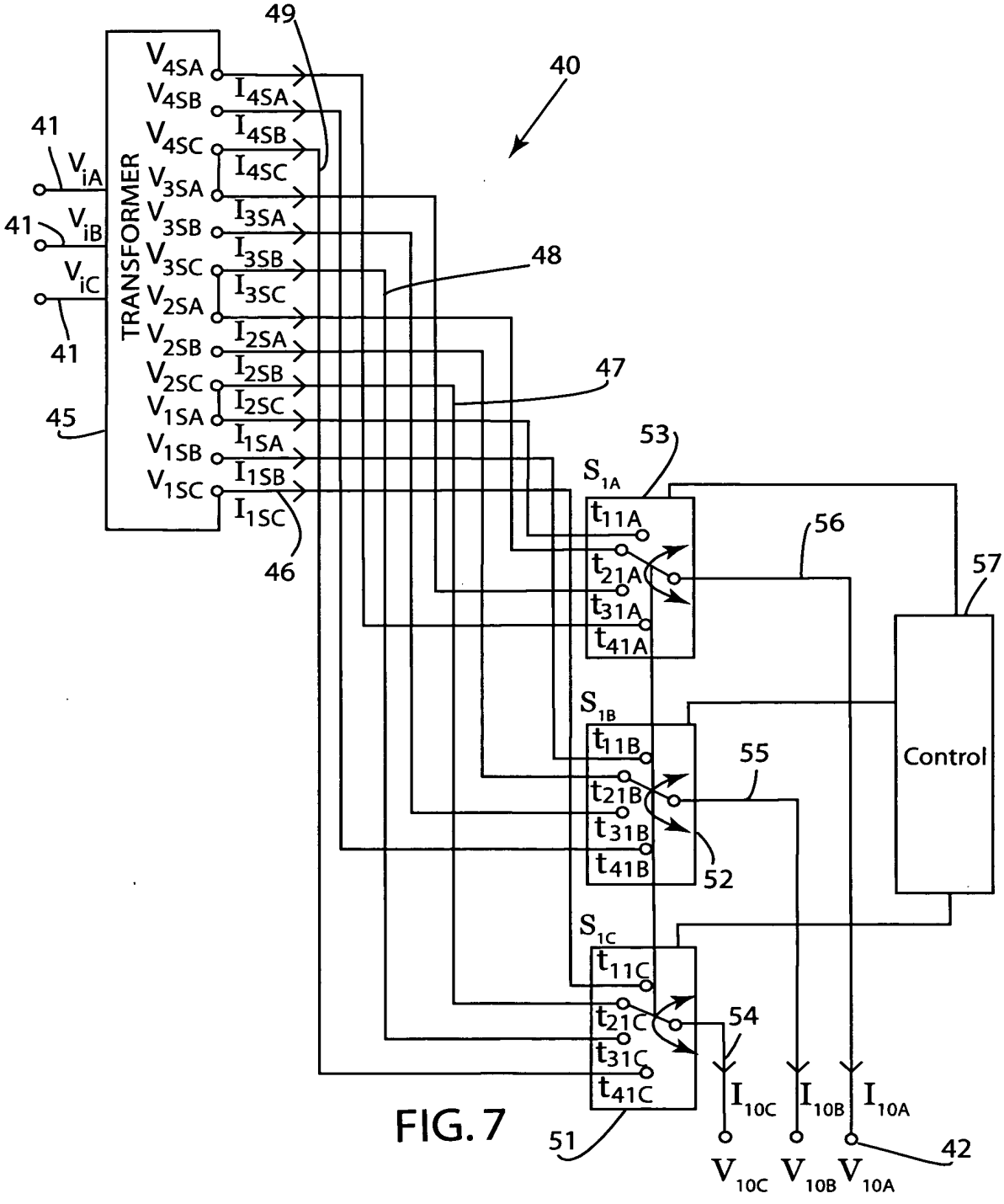
TRANSFORMER
V_{4SA}
V_{4SB}
V_{4SC}
V_{3SA}
V_{3SB}
V_{3SC}
V_{2SA}
V_{2SB}
V_{2SC}
V_{1SA}
V_{1SB}
V_{1SC}
I_{4SA}
I_{4SB}
I_{4SC}
I_{3SA}
I_{3SB}
I_{3SC}
I_{2SA}
I_{2SB}
I_{2SC}
I_{1SA}
I_{1SB}
I_{1SC}
V_{iA}
V_{iB}
V_{iC}
41
41
41
45
49
40
48
47
46
53
S_{1A}
t_{11A}
t_{21A}
t_{31A}
t_{41A}
56
57
S_{1B}
t_{11B}
t_{21B}
t_{31B}
t_{41B}
55
52
Control
S_{1C}
t_{11C}
t_{21C}
t_{31C}
t_{41C}
54
I_{10C}
I_{10B}
I_{10A}
51
42
V_{10C}
V_{10B}
V_{10A}

FIG. 7

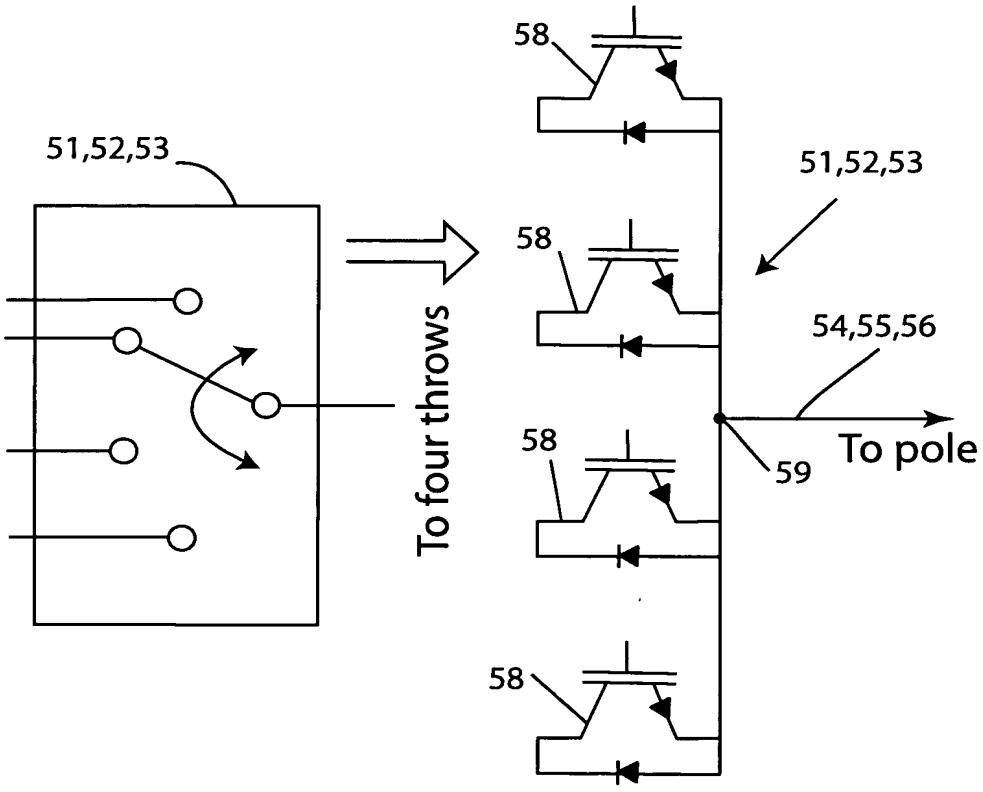

FIG . 8

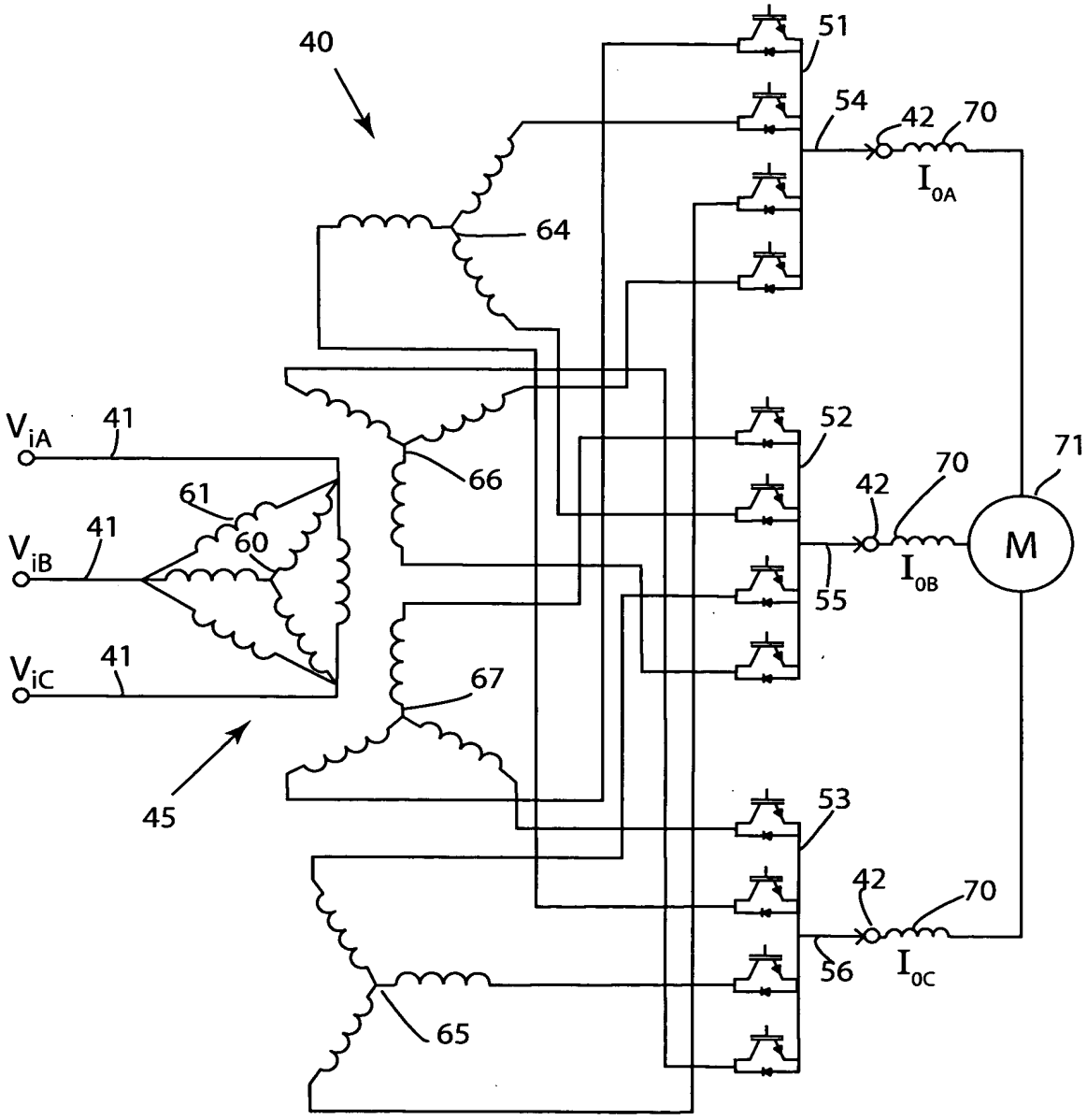
40
51
54
42
70
I_{0A}
64
V_{iA}
41
66
52
71
61
42
70
V_{iB}
41
60
M
I_{0B}
55
V_{iC}
41
67
45
53
42
70
56
I_{0C}
65

FIG. 9

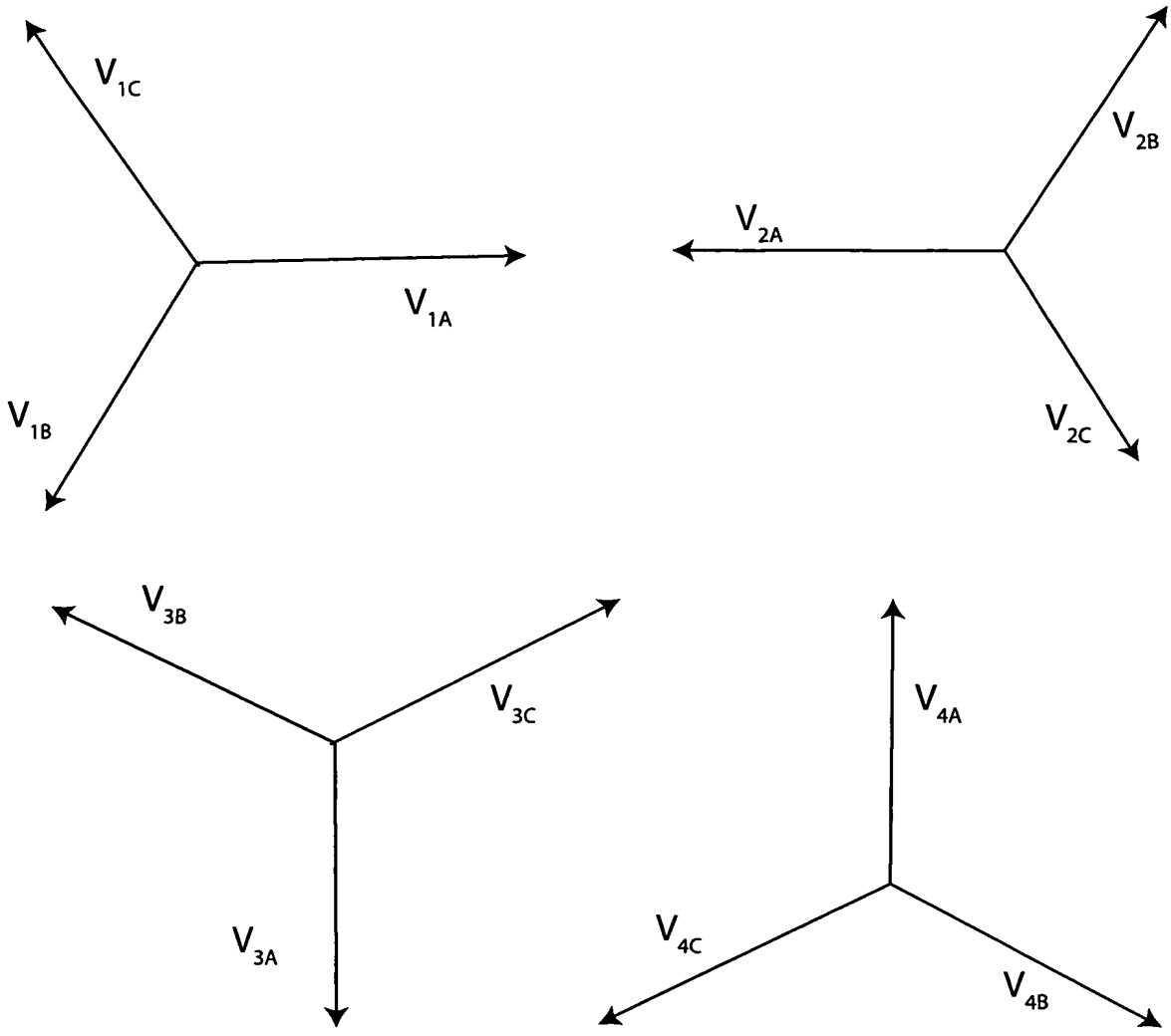

FIG. 10

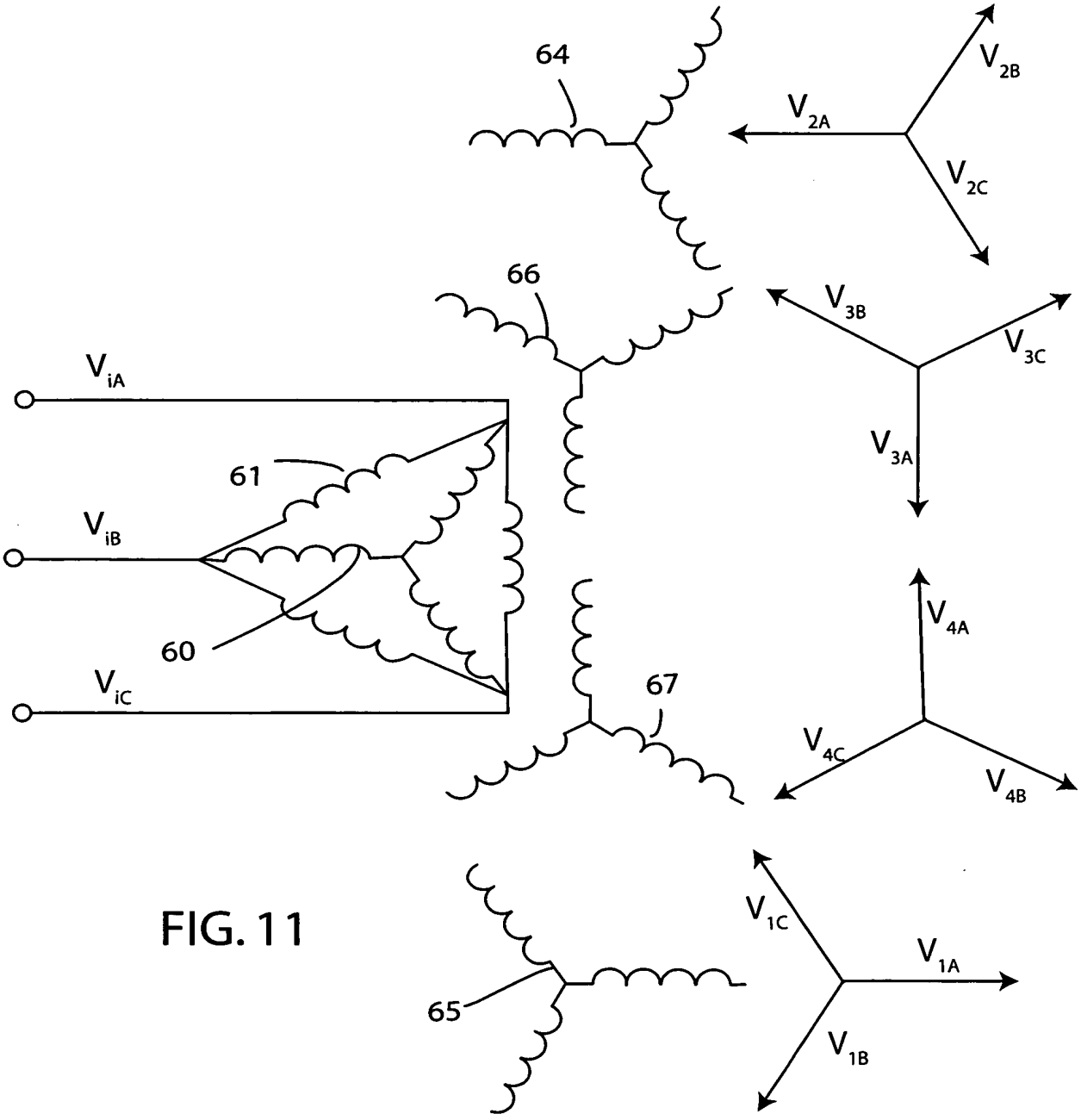
64
V_{2B}
V_{2A}
V_{2C}
66
V_{3B}
V_{3C}
V_{iA}
61
V_{3A}
V_{iB}
60
V_{iC}
67
V_{4A}
V_{4C}
V_{4B}
65
V_{1C}
V_{1A}
V_{1B}

FIG. 11

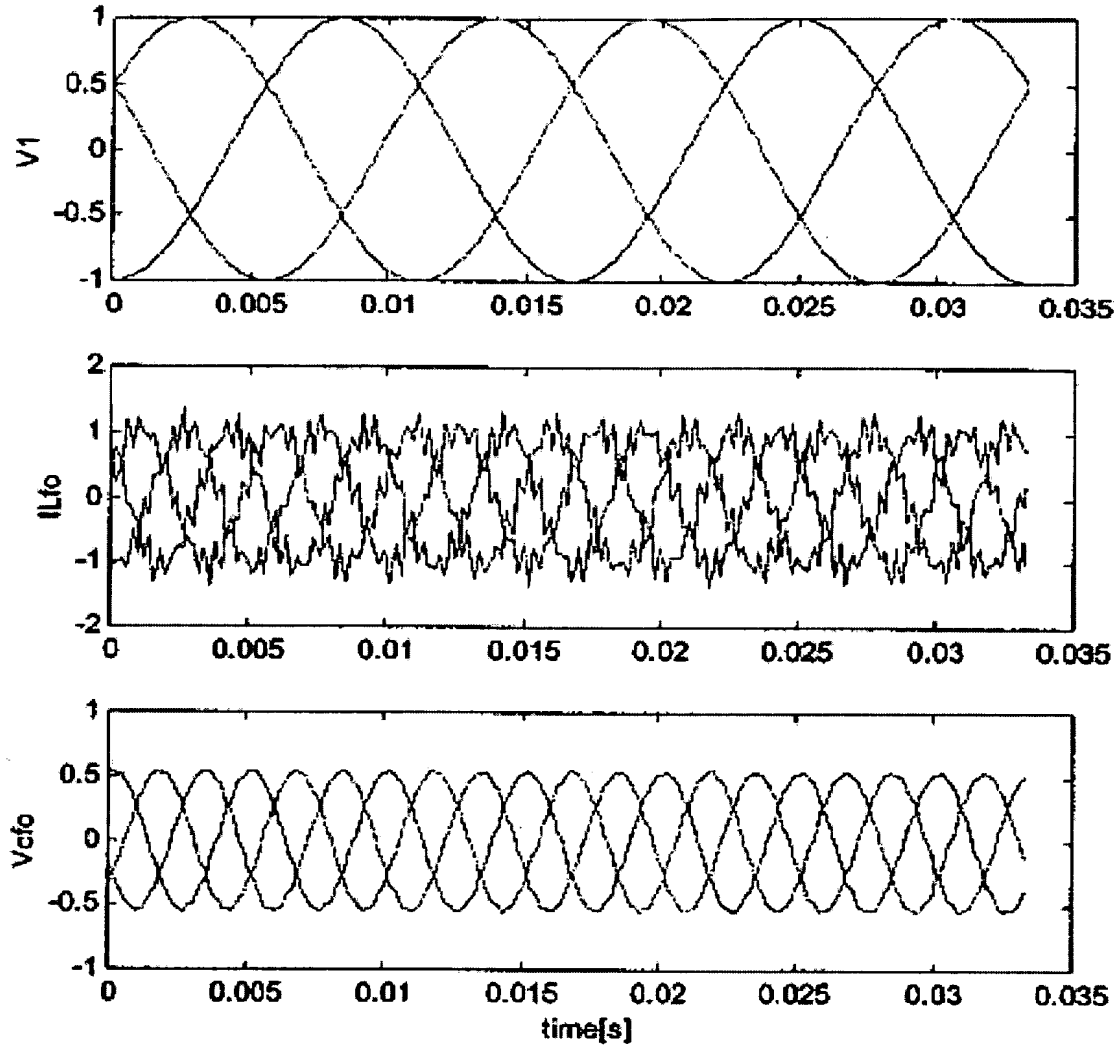
V1
1
0.5
0
-0.5
-1
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
ILfo
2
1
0
-1
-2
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
Vcfo
1
0.5
0
-0.5
-1
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
time[s]

FIG. 12

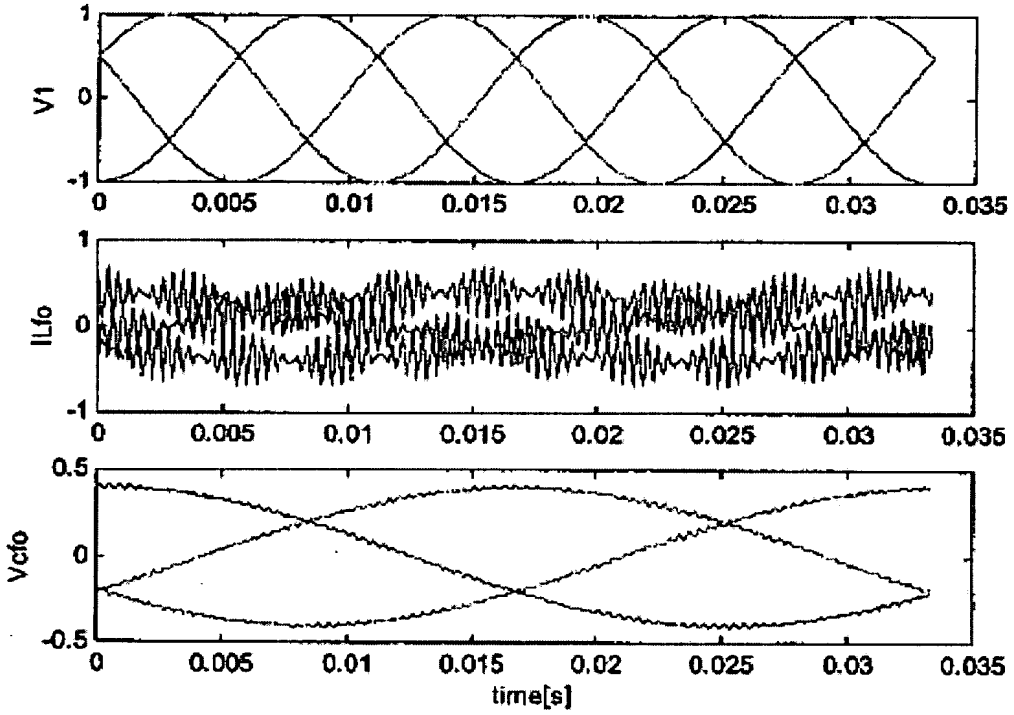
V1
1
0
-1
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
ILfo
1
0
-1
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
Vcfo
0.5
0
-0.5
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
time[s]

FIG. 13

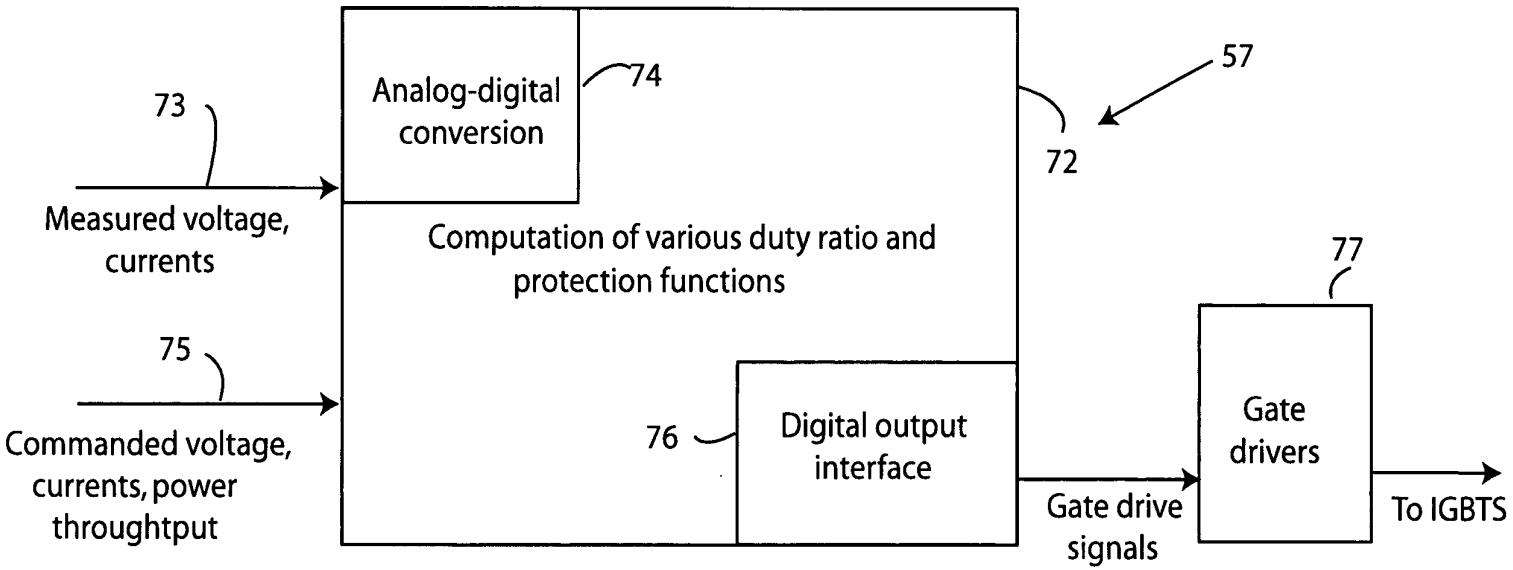
73
Measured voltage, currents
75
Commanded voltage, currents, power throughtput
Analog-digital conversion
74
Computation of various duty ratio and protection functions
76
Digital output interface
57
72
77
Gate drivers
Gate drive signals
To IGBTS

FIG. 14

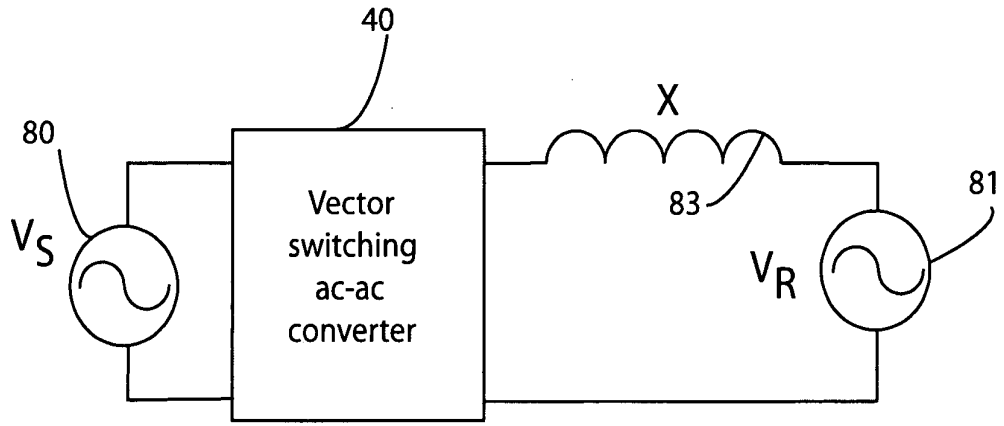
40
80
V_S
Vector switching ac-ac converter
X
83
81
V_R

FIG. 15

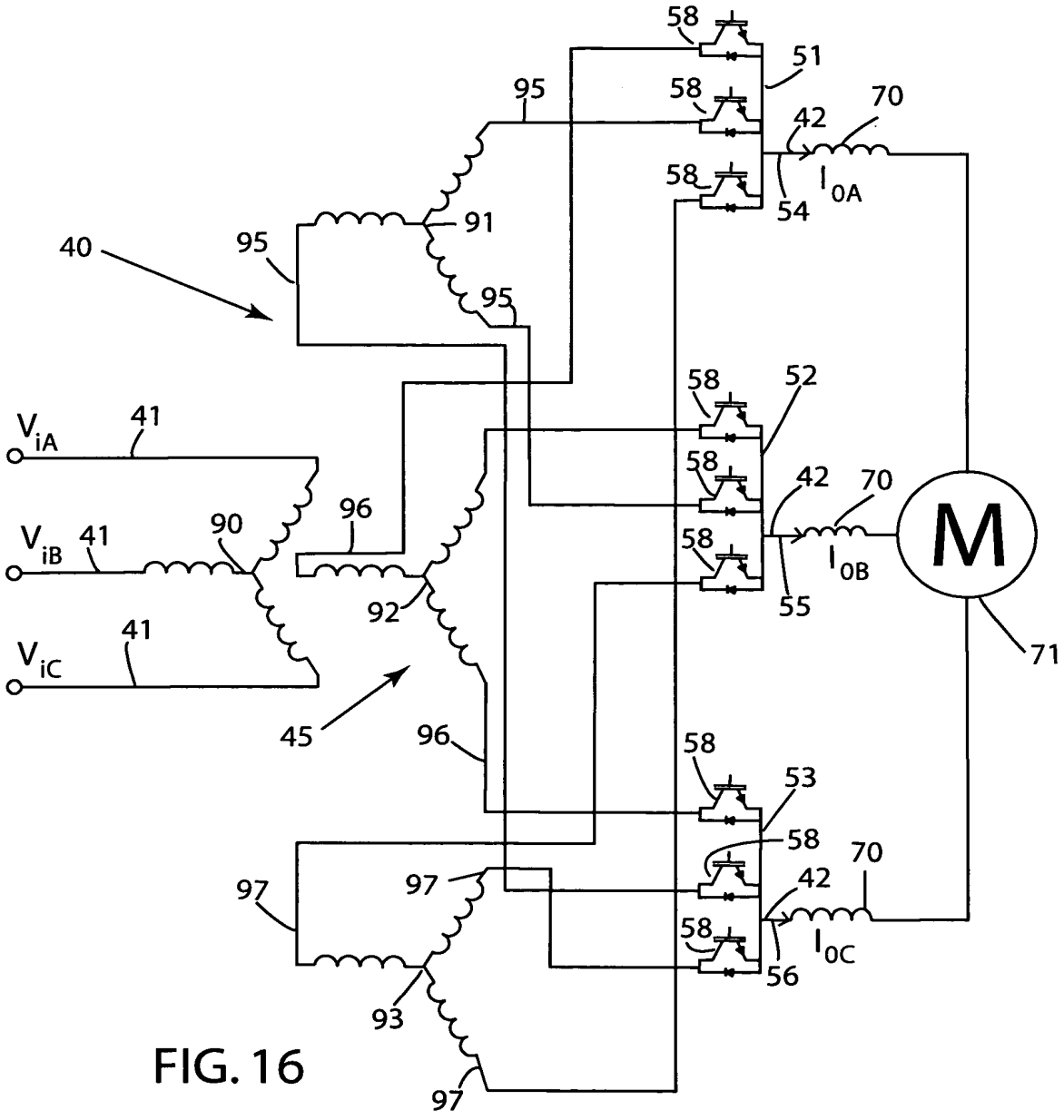
58
51
95
58
70
42
58
I_{0A}
54
91
40
95
95
58
52
V_{iA}
41
58
42
70
V_{iB}
41
90
96
58
M
I_{0B}
92
55
71
V_{iC}
41
45
96
58
53
58
70
97
97
42
58
I_{0C}
56
93
97

FIG. 16

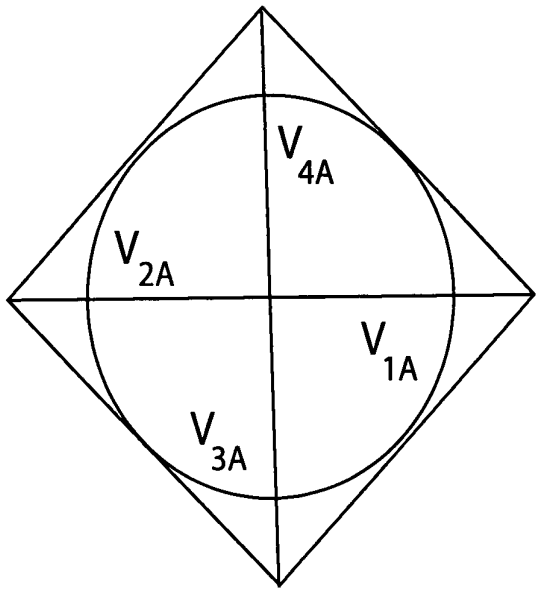

FIG. 17

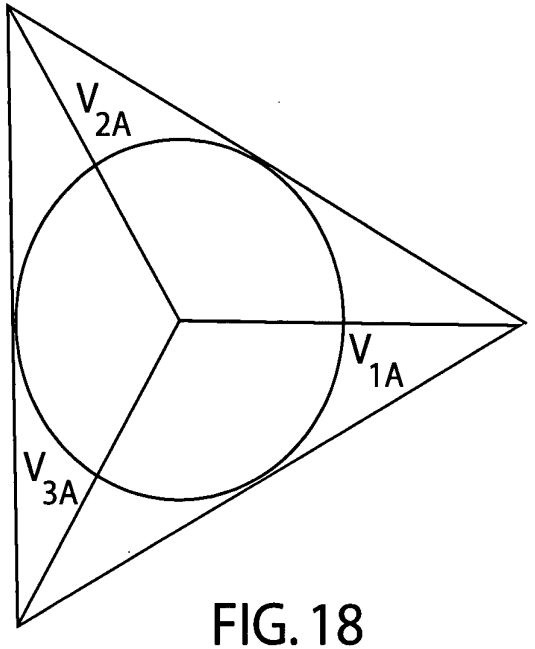

FIG. 18